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HEWLETT® PACKARD

HP 8923B DECT test solutions

Technical specifications

no compromise in measurement integrity



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Traceability to the ETSI CTR-06 standard

Measurement traceability

The measurement techniques used in the HP 8923B test set have been derived from the ETSI CTR-06 standard. This table shows the capability of the HP 8923B test set and where it is compliant with the CTR-06 standard.

DECT CTR-06 tests	Measurement on HP 8923B test set	Notes
Accuracy and stability of RF carriers *CTR-06 Section 7*	✓	
Jitter *CTR-06 Section 8.3*	✓	
Transmission burst *CTR-06 Section 9*	✓	Top 40 dB of the power versus time template is displayed.
Transmitted power *CTR-06 Section 10*	✓	
Frequency drift *CTR-06 Section 11*	✓	
RF carrier modulation *CTR-06 Section 11*	✓	
Emissions due to modulation *CTR-06 Section 12.2*	No	External time gated spectrum analyzer required.
Emissions due to transmitter transients *CTR-06 Section 12.3*	No	External spectrum analyzer required.
Spurious emissions *CTR-06 Section 12.5*	No	External spectrum analyzer required.
Emissions due to intermodulation *CTR-06 Section 12.4*	No	External spectrum analyzer required.
Radio receiver sensitivity *CTR-06 Section 13.1*	✓	An external RF signal generator must be used to carry out BER at ± 50 kHz offset.
Radio reference bit error rate *CTR-06 Section 13.2*	✓	
Radio receiver blocking: Case 1 *CTR-06 Section 13.4*	✓	An external CW RF signal generator (HP 83711A) is required for the measurement.
Radio receiver blocking: Case 2 *CTR-06 Section 13.5*	✓	An external DECT-like RF signal is required to act as the blocking source (such as the HP 8664A signal generator with options H10 and 008).
Receiver intermodulation performance *CTR-06 Section 13.6*	✓	An external DECT-like RF signal generator (HP 8664A option H10 and 008) and a CW RF signal generator (HP 83711A) are required for this.

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Specifications

HP 8923B test set specifications

The following describe the instruments warranted performance and apply after a 30 minute warm-up period. These specifications are valid over its operating/environmental range unless otherwise noted.

DECT source

RF carrier frequency [1]

Range: 1880 to 1900 MHz at DECT channels.

Frequency drift across the burst: Negligible (I/Q modulation technique used).

Accuracy: ±5 kHz.

RF carrier level

Range: –100 dBm to –10 dBm.

Resolution: 0.1dB.

Accuracy: ±1.0 dB.
(Compliant to CTR-06 Section 5.8.4).

Reverse power: 2 W continuous.

SWR: 1.5:1.

CW mode

Frequency accuracy: ±5 kHz.
(Compliant to CTR-06 Section 5.8.4).

Amplitude accuracy: ±1.0 dB.
(Compliant to CTR-06 Section 5.8.4).

Transmitter test

Note: The user is required to provide a signal from the device under test which matches the following criteria.

Frequency presented to the HP 8923B test set

Within ±200 kHz of DECT channel frequency.

Amplitude presented to the HP 8923B test set

Within ±6 dB of HP 8923B setting (Compliant to CTR-06 Section 5.8.5.1).

Normal transmitted power (NTP) measurement [1]

Range: –10 dBm to +30 dBm.
Accuracy: ±0.6 dB ± noise effects (0.015 mW).
(Compliant to CTR-06 Section 5.8.5.1).

Power versus time template measurement

Measurement range: –10 dBm to +30 dBm.

Dynamic range: 40 dB.

Accuracy: Typically 0.5 dB +0.1 dB per dB.

GFSK measurement [1]

Level: –10 dBm to +30 dBm

Peak frequency deviation measurement error:

Input amplitude setting undertainty	Frequency deviation measurement uncertainty
±1 dB	10 kHz
±3 dB	12 kHz
±6 dB	16 kHz

Center frequency measurement error [2]: ±1 kHz.

Frequency drift measurement error [3]: <1 kHz for drift < 20 kHz.

P0 detection accuracy: Typically 0.1 µs.

Timing jitter:

Measurement accuracy: 4 ns.

[1] Specifications also apply for CW measurement mode.
[2] Test pattern FACC should be used during this measurement.
[3] Test pattern FDEV2_FS should be used during this measurement.

Receiver test

Residualbit error

Ratio: 10^{-6} for PRBS $2^9 - 1$ (ITU-T 0.153).

Audio source

Frequency range: 20 Hz to 21 kHz.

Accuracy: 0.03% of setting.

Resolution: 0.1% Hz.

Level range: 0 V to 2 V.

Output impedance: Typically 70 ohm.

Accuracy: ±(4% of setting + resolution).

Resolution: ±1.3 mV peak.

Residual distortion: < 0.7 % for levels greater than 200 mV.

Audio analyzer

DC voltmeter

Accuracy: 1% of reading + DC offset.

DC offset: 45 mV.

Range: –5 V to +5 V.

Audio frequency counter

Input voltage range: 30 mV to +5 V.

Frequency range: 30 Hz to 400 kHz.

Accuracy: (0.05% + resolution + reference accuracy) for input > 30 mV and between 30 Hz and 50 kHz and for input > 80 mV and between 50 kHz and 400 kHz.

Resolution: f < 10 kHz: 0.01 Hz, f < 100 kHz: 0.1 Hz, f = 100 kHz: 1Hz.

Input range: 100 mV to +5 V.

AC voltmeter

Frequency Range: 50 Hz to 50 kHz.

Input impedance: Typically 100 ohm.

Input range: 10 mV to 5 V.

Accuracy: ±3% + noise.

Noise: < 1 mV peak.

Digital oscilloscope

Frequency range: dc to 50 kHz.

Accuracy: ±1.5% of reading ±0.1 division.
(For scale settings: 100 mV/div to 1 V/div).

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Reference

Standard frequency reference

Reference accuracy:
± (Time since calibration ´ aging rate) + temperature stability + accuracy of calibration (0.01 ppm).

Stability: 1 ppm (0 to 55 °C).

Aging: 2 ppm/year.

Warm-up time: < 30 minutes to be within 2 ppm of final frequency.

Precision frequency reference (Option 1D5)

Stability: < 2.5 ´ 10^{-3} ppm/°C (0 to 55 °C).

Aging: < 5 ´ 10^{-4} ppm/day after 24 hour warm-up.
< 0.1 ppm/year for continuous operation.

Warm up time: Within 5 ´ 10^{-4} ppm of final value 10 minutes after turn on at 25 °C.

Front panel

RF in/out: RF In/out through 50 ohm, Type-N connector. Maximum reverse power 2 W.

Trigger in: External trigger input through BNC connector, impedance typically 2 to 3 kohm.

Audio in: Input to built-in oscilloscope and audio analyzer through BNC connector.

Audio out: 20 Hz to 21 kHz audio signal output through BNC connector.

Rear panel

HP-IB: IEEE 488.2 I-Basic/print serial port: RS-232-C through RJ-11 connector used for serial input/output.

Logging port: RS-232-C through RJ-45 connector used for serial logging.

Baud rates: 300, 1200, 2400, 4800 and 9600 baud.

External signal generator control: Data, clock and trigger signal to drive an external RF signal generator through BNC connectors.

Sync in/sync out: Two RJ-45 connectors which allow multiple HP 8923B test sets to be connected in series to ensure that all transmissions are time synchronized.

Aux RF connector: RF in/out through 50 ohm SMA connector, output level is Typically 12 dB lower than front panel setting. (Must be terminated in a 50 ohm load when not in use.)

Handset port: Audio in/out through RJ-45 connector.

Input impedance: 200 kohm.

Sensitivity: 12 mV_{rms} (typical) supplies bias to drive an electret microphone.

Output: 110 ohm, 1 V_{rms} differential.

Rx data: Output of demodulated data from the EUT.

Tx data:
TTL output of data transmitted by HP 8923B test set.

Composite video output: PAL compatible 15.625 kHz scan rate video output to drive an external monitor.

Meas trig: TTL signal to trigger external test equipment eg a time gated spectrum analyzer. The trigger signal is derived from the trigger being used internally by the HP 8923B test set during measurements.

Ext ref in: Allows the connection of an external 10 MHz frequency reference. The 10 MHz ref out may be connected instead of an external reference.

Opt 1D5 ref out: Provides an output from the option 1D5 precision frequency reference.

10 MHz ref out: Provides an output from the internal frequency reference.

Internal programming

Programming language: Hewlett-Packard Instrument BASIC.

General specifications

Size (H ´ W ´ D) : 177 mm ´ 426 mm ´ 574 mm (7 in ´ 16.75 in ´ 23 in).

Weight: 32 kg (70 lb).

Operating temperature: 0 °C to 55 °C.

Power: 100, 120, 220 and 240 Vac, 48 to 440 Hz, ±10% of line voltage.

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Ordering Information

HP 8923B DECT test set

Option 0BF	Programming reference manual (additional)
Option AV4	Users manual (additional)
Option 0B3	Servicemanual
Option 1D5	High stability frequency reference
Option 1CP	Rack mount and handle kit
Option K06	Serial printer connector and cable (RJ11 to D-type RS232)[1]

Associated test equipment

HP 8590E Series spectrum analyzer
(HP 8593E, 94E, 95E and 96E cover the DECT frequency band)

Option 004	Precision frequency reference
Option 112	DECT demodulator card
Option 012	DECT source
Option 105	Time gated spectrum analysis card
Option 101	Fast time domain sweep card

HP 8664A/8665A/8665B synthesized signal generator

Option H10	DECT modulation
Option 008	Pulse modulation

HP 6632A DC power supply

HP 3488A switch unit

HP 53131A 225 MHz universal counter

Recommended HP accessories

HP 10438A	Miniature oscilloscope probe (high impedance/40pF 1:1 probe 08920-61060 antenna)
HP 11667A	DC - 18 GHz power splitter)
HP 83230A	64kbytes SRAM PCMCIA memory card [2]
HP 83231A	1Mbyte SRAM PCMCIA memory card

For further information on the HP 8923B DECT Test Set the following literature may be ordered: DECT test solutions photocard (5964-4110E).

[1] Cable may be used for connection to a serial printer or for protocol logging to a terminal emulator (e.g. a PC running the Microsoft Windows®, terminal program)
[2] A 64kb SRAM PCMCIA memory card is provided with every HP 8923B test set.

MS Windows is a US trademark of Microsoft Corporation.

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